

Rule 312 Amendment

U.S. Application Serial No. 10/082,818

Attorney Docket No. MR/98-004.C

Page 2 of 9

I. AMENDMENTS TO THE SPECIFICATION

The sections below have been amended in the manner required by 37 C.F.R. §1.121 (as revised July 30, 2003), showing the additions underlined and the deleted portions stricken through.

A. IN THE TITLE

Please change the TITLE as directed below, specifically by substituting the new (underlined) title for the old (bracketed) one.

**NEUROVASCULAR COIL SYSTEM AND INTERFACE AND SYSTEM THEREFOR AND
METHOD OF OPERATING SAME IN A PLURALITY OF MODES**

~~[MULTIMODE OPERATION
OF
QUADRATURE PHASED ARRAY MR COIL SYSTEMS]~~

C. IN THE "SUMMARY OF THE INVENTION" Section

Please amend the SUMMARY OF THE INVENTION section as directed below, specifically by adding the four new (underlined) paragraphs and deleting the two old (bracketed) paragraphs. After this amendment, the SUMMARY OF THE INVENTION section should contain only the four new (underlined) paragraphs. (Be advised that the two old (bracketed) paragraphs were introduced to this application in the *Preliminary Amendment* filed June 28, 2002.)

SUMMARY OF THE INVENTION

In a first aspect, the invention provides a coil interface for coupling a neurovascular coil system to a magnetic resonance (MR) system. The neurovascular coil system has an array of coils including a birdcage coil, a spine coil, and at least one neck coil, with the MR system being equipped with a number of receivers. The coil interface includes a plurality of input ports, a plurality of output ports, and an interface circuit. The plurality of input ports are for coupling to the coils of the neurovascular coil system, and the plurality of output ports for coupling to the receivers of the MR system. The interface circuit enables the input ports and output ports to be selectively interconnected, and thereby enables the neurovascular coil system to be selectively operated in (I) a neurovascular mode; (II) a high resolution brain mode; (III) a high speed brain mode; and (IV) a volume neck mode.

In a related aspect, the invention provides a neurovascular coil system for coupling to a magnetic resonance (MR) system, with the MR system being equipped with a number of receivers. The neurovascular coil system includes an array of coils, a plurality of input ports, a plurality of output ports, and an interface circuit. The array of coils includes a birdcage coil, at least one spine coil, and at least one neck coil. The birdcage coil is connected to at least one of the input ports. The at least one spine coil is connected to one of the input ports, and the at least one neck coil is connected to at least one of the input ports. The plurality of output ports are for coupling to the receivers of the MR system. The interface circuit enables the input ports and output ports to be selectively interconnected, and thereby enables the neurovascular coil system to be selectively operated in (I) a neurovascular mode; (II) a high resolution brain mode; (III) a high speed brain mode; and (IV) a volume neck mode.

In another related aspect, the invention provides a method of operating a neurovascular coil system with a magnetic resonance (MR) system. The method includes the steps of: providing a plurality of input ports for coupling to the coils of the neurovascular coil system; providing a plurality of output ports for coupling to the receivers of the MR system; and selectively interconnecting the input ports and the output ports, and thereby enable the neurovascular coil system to be selectively operated in (I) a neurovascular mode; (II) a high resolution brain mode; (III) a high speed brain mode; and (IV) a volume neck mode.

In another related aspect, the invention provides a magnetic resonance (MR) system. The MR system includes a number of receivers and a neurovascular coil system, with the neurovascular coil system being operably connectable to other components of the MR system. The neurovascular coil system includes an array of coils, a plurality of input ports, a plurality of output ports, and an interface circuit. The array of coils includes a birdcage coil, at least one spine coil, and at least one neck coil. The birdcage coil is connected to at least one of the input ports. The at least one spine coil is connected to one of the input ports, and the at least one neck coil is connected to at least one of the input ports. The plurality of output ports are for coupling to the receivers of the MR system. The interface circuit enables the input ports and output ports to be selectively interconnected, and thereby enables the neurovascular coil system to be selectively operated via the MR system in (I) a neurovascular mode; (II) a high resolution brain mode; (III) a high speed brain mode; and (IV) a volume neck mode.

~~[In one presently preferred embodiment, the invention provides a coil interface for coupling a phased array coil system to a host magnetic resonance imaging (MRI) system. The host MRI system has a number of receiver channels for receiving magnetic resonance (MR) signals, and the phased array coil system has a plurality of coil elements. The coil interface comprises a plurality of input ports, a plurality of output ports, and an interface circuit. The input ports are adapted to be coupled to the plurality of coil elements. The output ports are adapted to be coupled to the receiver channels of the host MRI system. The interface circuit allows selective interconnection of at least two of the input ports to at least one of the output ports, thereby allowing the phased array coil system to be selectively operated through the host MRI system in any one of a plurality of operational modes during an MRI scanning procedure.]~~

~~In a related aspect, the invention provides a method of operating a phased array coil system in a plurality of operational modes. The phased array coil system has a plurality of coil elements capable of operating with a host magnetic resonance imaging (MRI) system during an MRI scanning procedure. The method comprises the steps of providing and selectively configuring an interface circuit. The former step involves providing an interface circuit that has (i) a plurality of input ports for coupling to the coil elements and (ii) a plurality of output ports for coupling to a number of receiver channels of the host MRI system. The later step involves remotely configuring the interface circuit to selectively interconnect at least two of the input ports to at least one of the output ports, thereby allowing the phased array coil system to be selectively operated through the host MRI system in any one of the operational modes during an MRI scanning procedure.]~~